ELECTROCHEMICAL CHARACTERIZATION AND VOLTAMMETRIC ANODIC STRIPPING METHODS FOR THE DETERMINATION OF VALSARTAN

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Heart diseases or cardiovascular diseases are the class of diseases that involve the heart or blood vessels (arteries and veins). Valsartan (VSN), N- valeryl- N\[2- (IH- tetrazol-5- yl)biphenyl-4- yI] methyl]valine is angiotensin II receptors, thus relaxing blood vessels and causing them to widen, which lowers blood pressure and improves blood flow [1-3].

The accurate, precise and rapid analytical procedure for the determination of VSN in pharmaceutical preparations is of great significance. Spectrophotometry, high performance liquid chromatography (HPLC) have been utilized for the determination of VSN, but complicated preconcentration or multisolvant extraction techniques is also related to these techniques due to the complexity of the real samples and the low concentration of the analyte. Electrochemical adsorptive stripping methods, especially differential pulse voltammetry (DPV) and square-wave voltammetry (SWV), make it possible to decrease the analysis time as compared to the time exhausted chromatographic methods.

In this study, electrochemical behaviours of VSN on glassy carbon electrode (GCE) were investigated by cyclic voltammetry, constant bulk electrolysis (BE) in Britton-Robinson (BR) buffer solution. Adsorption and diffusion properties of VSN were studied. VSN is oxidized at about +1.10V (vs Ag/AgCl) at pH 3.0. A differential pulse adsorptive anodic stripping voltammetric (DPAdSV) and square wave adsorptive anodic stripping voltammetric (SWAdSV) methods were developed to its direct determination in pharmaceutical preparations and biological samples. For the DPAdSV and SWAdSV techniques, linear ranges were found to be between 1.0×10⁻⁶ M and 1.0×10⁻⁴ M. For the DPAdSV technique, accumulation potential and accumulation time were found to be +0.80V and 60s, respectively. The corresponding data found by SWAdSV technique were +0.20V and 45s, respectively. In addition, validation parameters, such as reproducibility, sensitivity, and recovery were evaluated as well. The methods were successfully applied to the analysis of valsartan in the pharmaceutical tablet formulations and in human serum samples.

References